

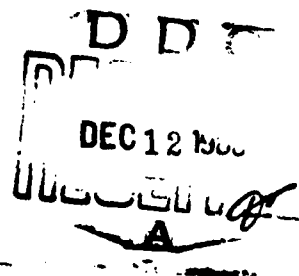
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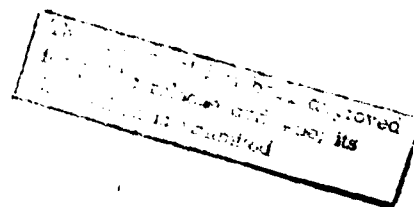
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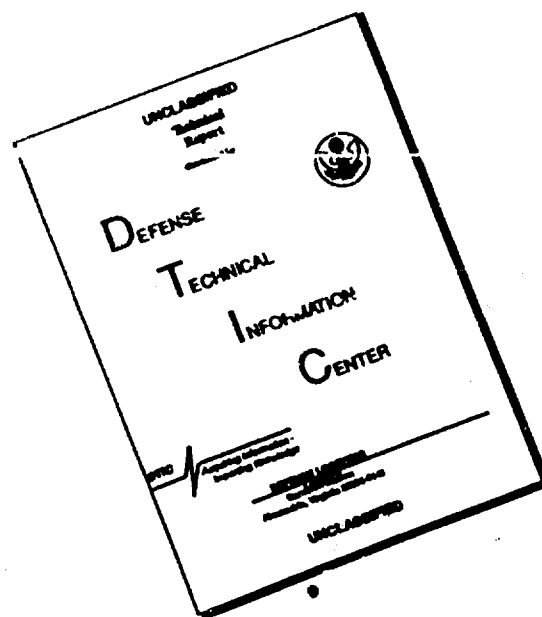


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AT THE INTERNATIONAL ASTRONOMICAL UNION

[Following is the translation of an article by A. A. Mikhaylov, Corresponding Member of the Academy of Sciences USSR, in Vestnik Akademii Nauk SSSR (Herald of the Academy of Sciences USSR), Vol 31, No 12, December 1961, pages 94-97.]

The eleventh session of the International Astronomical Union (IAU) was held in the middle of August at the university city of Berkeley, near San Francisco. Such sessions, as a rule, convene every three years and constitute a review of achievements in all fields of astronomical science and determine to a great extent the direction of its development in the next three years. The main work occurs in the commissions on various branches of astronomy. Here reports on research that has been completed are discussed and means of scientific collaboration in major complex problems requiring international cooperation are studied.

Some 947 scientists from 36 countries, including 45 from the Soviet Union, convened in Berkeley. The program opened on the morning of 15 August under an open sky in a square among the building of the University of California. There were almost 10,000 people assembled, among them participants of the IAU, teachers and students of the University, as well as inhabitants of Berkeley. D. H. Menzel, the Director of the Harvard Observatory, greeted the IAU on behalf of the US National Academy of Sciences. After the traditional speech of the president of the IAU, the Dutch scientist J. Oort, a long address of greeting was delivered to the IAU on behalf of the US government by A. Stevenson, the US representative at the UN. Recalling that the previous session occurred in Moscow, he expressed satisfaction in the participation at the present session by the large delegation from the USSR. In speaking about the wonderful achievements of science and the need for their fuller utilization for the welfare of mankind; he said that the preservation of peace and the cessation of armament constitute the most important problems of today. He made, however, several disguised attacks against the socialist countries.

In the ensuing plenary session the question arose concerning the participation of Taiwan in the IAU. Despite the complete absence of astronomical institutions there, the executive committee of the IAU by majority vote accepted Taiwan among the number of countries represented in the organization. After this action the People's Republic of China withdrew from the IAU. The national committees of the USSR and Czechoslovakia registered a protest against the acceptance of Taiwan. Scientific and scientific-organizational questions requiring

international collaboration were discussed at the branch commissions. For example, the latitude commission (No 19) studied the fate of the International Bureau of Latitude which until recently was situated in Turin. This bureau is charged with determining the motion of the poles on the earth's surface from a combination of observations from from all observatories engaged in accurate determinations of latitude; primarily by observations from five international stations situated on the single parallel $39^{\circ}08'$, that is to say, Carlofort (Italy), Kiteb (USSR), Mizusawa (Japan), Ukiah, and Gettysberg (US). Chekkini, the Director of the International Latitude Bureau, requested that he be relieved of his duties because of his health. In connection with this a question was raised concerning the transfer of the Bureau to another site. The Commission accepted the proposal of Japan--to relocate the Bureau in Mizusawa. It was noted that Japanese astronomers have great experience in research on the motion of the earth's poles and that the latitude station in Mizusawa is equipped with the latest instruments for observing fluctuations in latitude and has a staff of competent collaborators.

Three lectures were devoted to essential questions of astronomy. The eminent American physicist, G. A. van Allen delivered the first one on the radiation belts around the earth. The outstanding German scientist, M. Shvartsschil'd presented a well constructed theory on the evolution of stars. Academician V. A. Ambartsumyan devoted his lecture to problems of outer-galactic astronomy.

Questions of a general nature were discussed at the concluding plenary session. A discussion was held revealing the relationship of the IAU to the "West Ford" project of MIT. According to this project up to 35 kg of minute metallic needles are supposed to be launched into space by means of an artificial satellite. They would then form, a ring around the earth, similar to the ring of Saturn. Their purpose would be to reflect and disperse radio waves and to afford the possibility to establish short wave communications among small points on the earth's surface.

As was mentioned at the Union, such a project, despite its attraction, has concealed within itself great dangers: the belt of metallic needles is a screen which prevents the passage of radio waves through it, thus first of all limiting radio astronomical observations and hiding space radio sources from us. Moreover, the direction of the flight of interplanetary rockets is made difficult, and with the great density of such a belt optical observations are also affected. A similar obstruction of cosmic space can also have other negative consequences.

In connection with this the Union addressed all government, organizing space research, not to conduct any experiments which might obstruct cosmic space, without consultations with the IAU and without being convinced that these experiments will not cause damage to astronomical research.

As was reported by the press on 22 October, the US in spite of the recommendations of scientists attempted to execute its anti-scientific experiment and launch into space by means of an artificial

satellite "Midas" 350 million copper needles. The Soviet astronomers expressed indignation at this "crime against reason", as F. Khoyl, professor of astronomy, at Cambridge University, so justly called the plan for the creation of a ring of copper needles around the earth. The Americans clearly calculated to utilize astronomy as a screen for the realization of their military program. Fortunately, this time American technology did not work out: the satellite hardly left for orbit when the mechanism for launching the needles failed.

At the conclusion of the IAU elections were held for officers. V. A. Ambartsumyan was elected President of the IAU for the next three years. The eminent Mexican astronomer, G. Haro, and Professor I. Hagiwara of Tokyo University were elected to the positions of the two former vice-presidents. An announcement was made regarding the reception of three countries into the IAU: Brazil, the Korean Peoples Democratic Republic and Turkey, and also regarding the new composition of the commissions. Six Soviet scientists became presidents of different commissions, six vice-presidents, and twelve entered the permanent bureaus of the commissions. Thus, the USSR government has been strengthened in the IAU. Some 154 Soviet scientists are presently in this organization.

During the course of the days preceding and following the IAU a number of scientific symposiums were conducted; the author of this report participated in two of them. "The Symposium on the Century of Space", organized by the Douglas Airplane Company in Pasadena, near Los Angeles, was devoted to questions on the organization of scientific research from outer space. The speakers were not only astronomers, but also engineers, concerned with questions of rocket technology, physics, and developing means for directing satellites and interplanetary rockets by radio. Medical men, studying the influence of cosmic factors on people and animals, and other specialists also participated in the symposium.

The Symposium on Outer Galactic Astronomy took place in Santa Barbara, California. Recently in this bureau of a developing branch of astronomy many new results have been obtained and the rapid perfection of technology in observation by means of the utilization of powerful optical and radio telescopes, and the most recent achievements in physics, promise for the near future a still greater expansion of our knowledge about the most remote regions of the universe. At the end of each day of symposium work, one of the most outstanding specialists summarized the reports heard, grouping them thematically, thus stating his own particular views and considerations on the main questions. Such a procedure merits wide inclusion into the practice of other scientific conferences.

Soviet scientists also participated in a symposium on solar activity and its influence on the earth and in a symposium on radio astronomy.

The IAU and the symposiums accompanying it constituted a view of world astronomical science. In this connection, naturally, the questions arose concerning the position and relative standing of Soviet astronomy. A similar question was put to me during the press conference soon after the session in California, and my answer was expressed approximately as follows:

Contemporary astronomy is an extremely vast science, and the distance from its classical fields, astronomical mechanics and meridional astronomy, to the new fields of astrophysics and radio physics is very great. Therefore, it is not surprising that in different countries the level of development in these fields varies depending upon historical and local conditions.

Thus in the field of astrometrics Soviet astronomy occupies an advanced position, mainly due to the fundamental work of the Pulkovo Observatory, concerning which the outstanding American astronomer Newcomb wrote: "Two great observatories Greenwich and Pulkovo with their rich resources, superiority of instruments and constancy of work occupied a leading position in obtaining fundamental data in astronomy." He also mentioned that the Pulkovo observers "paying the most careful attention to the removal of all sources of error, have achieved such a degree of perfection in their work which is not possible for routine observers." This high position which the Pulkovo Observatory has occupied since its very foundation in the field of astronomy is maintained by it with honor even at the present time.

The difficult wounds inflicted by the war have been healed, the destroyed observatories have not only been reconstructed but also considerably expanded, a number of new, completely contemporary astronomical establishments have risen in the Ukraine, the Caucasus, in Central Asia, and in the Far East. As a result of this, such important work as research with regard to the sun, meteors, the study of the moon, and radio astronomical observations have been greatly developed.

There remains only one branch of astronomy in which Soviet scientists until quite recently could not actively work because of the absence of sufficiently powerful instruments. This was the field of outer galactic astronomy. The main research in this field has been conducted in observatories of California where the very largest reflectors, up to 5 meters inclusively, are concentrated. Now the position has changed substantially. At the Crimean Astrophysical Observatory, construction has begun on a reflector with a 2.5 meter aperture. This is third in size in the world and the largest in Europe. In the Byuransk Observatory near Yerevan, a metric anaberrational reflector, one of the largest of its type, has been installed. In the years of the near future the observatories of a number of Academies of Science of the Union Republics are to be equipped with large instruments. Soon the USSR will surpass all the other countries not only in the number of powerful instruments, but will possess the largest and the most perfected reflector in the world.

As far as outer space astronomical observations are concerned the whole world knows of the photographs of the back of the moon which were obtained by a Soviet interplanetary automatic station on 7 October 1959. In the future outer atmospheric observations will be quickly disseminated in connection with the new potentials which have been created in the USSR by the development of advanced rocket technology. Thus, all the conditions exist for Soviet science as regards the universe to take first place in the world.